proceeding southwestward some 100 to 200 or more miles west of the Oregon coast, lowest barometer 29.08 inches, on the 2d. Much farther at sea, near 43° N., 148° W. the Japanese motorship *Genyo Maru* encountered strong gales to hurricane winds, lowest barometer 28.71, on the 3d.

In connection with the midocean cyclone of this period in January, abnormally low pressures were recorded over a considerable region south of the Aleutians. Readings close to 28 inches were had on several ships, with an accompaniment of strong to storm gales (forces 9 to 11). The British steamship *Toorak*, already mentioned as having a barometer reading of 27.76 inches on the 4th, encountered the full strength of the wind in a northwesterly gale of force 11 near 42° N., 176° E., on the 5th. Stormy conditions, with wind forces of 8 to 10, continued through the 6th within the region of about 40° to 50° N., 175° E. to 170° W., but thereafter abated.

The early January cyclone east of Japan was of practically equal intensity and extent to those previously mentioned, except that the barometer did not fall to similar depths. On the 1st and 2d the British steamship *Toorak*, and on the 3d the Norwegian motorship *Tai Yang*, experienced northerly gales of force 11 within the locality, 41°–42° N., 153°–156° E. Outside the immediate locality gales of force 8 to 10 occurred over a wide stretch of sea from near the coast of Japan, on to the eastward, where the storm area merged with that prevailing in middle longitudes.

Widespread low pressure continued through the 10th over the western half of the ocean, with much stormy weather. In fact, during the first third of the month, fully three-fourths of January's gales occurred. The 7th was the day of most intense winds, with hurricane forces experienced by the Norwegian motorship *Pleasantville* near 38½° N., 156½° E., and by the Japanese steamship *Shoyo Maru* near 40½° N., 161½° E.

Following the 10th storm energy had greatly subsided, so that, up to the 15th, only scattered gales were reported. The one intense wind of the period thus far coming to attention was a west gale of force 12, encountered by the American steamship *President Pierce* on the 13th near 32° N., 155° E.

The North Pacific, during the final half of the month, was unusually free of gales for January, and such as were reported on extratropical waters for the 16th to 31st did not exceed 9 in force. Those particularly to be noticed were observed as follows on the Swiftsure Bank Lightship: Of force 8 on the 17th, 18th, and 28th, and of force 9 on the 25th.

Gales of the Tropics.—The tropical gales reported for the month occurred in two localities—the Gulf of Tehuantepec and the China Sea. In the Gulf there were Tehuantepecers of force 7 on the 6th, 18th, and 21st. On the 25th, with the crest of an anticyclone lying over the Gulf States and the northern part of the Gulf of Mexico, the consequent Tehuantepecer, as experienced by the American steamship *Alabaman*, attained an intensity of force 11. In the China Sea the British steamship *Lacklan* encountered a northeast gale of force 10, barometer 29.95, near 15° N., 119° E., on the 8th.

Fog.—Very little fog was seen on the North Pacific this month. There were scattered occurrences in northern waters on 4 days early in January, and about midway between California and the Hawaiian Islands, fog was observed on 5 days, mostly near the middle of the month. Ships reported fog on 4 days along the west coast of the United States; on 2 days off Lower California; and 1 day each near Cape Corrientes; in the Gulf of Tehuantepec; and off the coast of Costa Rica.

CLIMATOLOGICAL TABLES

[Climate and Crop Weather Division, J. B. KINCER in charge]

DESCRIPTION OF TABLES AND CHARTS

By J. P. KOHLER

Table 1 presents average and extreme values for 45 climatic districts, based on all available data ascertained by regular and cooperative Weather Bureau stations.

Table 2 gives the data ordinarily needed for climatological studies for about 180 Weather Bureau stations making simultaneous observations at 7:30 a. m. and 7:30 p. m. daily, 75th meridian time, and for about 20 others making only one observation. The altitudes of the instruments above ground are also given.

Beginning with January 1, 1932, all wind movements and velocities published herein are corrected to true values by applying to the anemometer readings, corrections determined by actual tests in wind tunnels and elsewhere.

Table 3 gives, for about 37 stations of the Canadian Meteorological Service, the means of pressure and temperature, total precipitation, depth of snowfall, and the respective departures from normal values, except in the case of snowfall. The sea-level pressures have been computed according to the method described by Prof. F. H. Bigelow in the REVIEW of January 1902, **30**:13–16.

Table 4 lists the severe local storms reported in the United States during the month. It is compiled from reports furnished mostly by officials of the Weather Bureau.

In regard to discussion of charts that follow: Charts I, IV, V, and VI are based on observational data from stations listed in table 2.

Chart I. *Temperature departures and wind roses for selected stations.*—This chart presents the departures of the monthly mean surface temperatures from the monthly normals. The shaded portions of the chart indicate areas of positive departures and unshaded portions indicate areas of negative departures. Generalized lines connect places having approximately equal departures of like sign. Charts of monthly surface temperature departures in the United States was first published in the MONTHLY WEATHER REVIEW for July 1909, and continued thereafter, but smaller charts appear in W. B. *Bulletin U* for 1873 to June 1909. inclusive. An innovation has been made in this chart, beginning January 1939. The selected wind rose data formerly published as chart VII has been transferred to this chart. The wind roses are based on hourly percentages by months for 28 selected Weather Bureau stations.

Chart II.—*Tracks of centers of* ANTICYCLONES; and Chart III.—*Tracks of centers of* CYCLONES. The roman numerals show the chronological order of the centers. The figures within the circles show the days of the month, the location indicated being that at 7:30 a. m., 75th meridian time. Within each circle is also an entry of the last three figures of the highest barometric reading (chart II) or the lowest reading (chart III) the reported at or near the center at that time, in both cases as reduced to sea level and standard gravity. The intermediate 7:30 p. m. locations are indicated by dots. The inset map on chart II shows the departure of monthly mean pressure from normal and the inset on chart III shows the change in mean pressure from the preceding month.

The use of a new base map for charts II and III began with the January 1930 issue.

Chart IV.—*Percentage of clear sky between sunrise and sunset.*—The average cloudiness at each regular Weather Bureau station is determined by numerous personal observations between sunrise and sunset. The difference between the observed cloudiness and 100 is assumed to represent the percentage of clear sky, and the values thus obtained are the basis of this chart. The chart does not relate to the night hours.

Chart V.—*Total precipitation.*—The scales of shading with appropriate lines show the distribution of the monthly precipitation according to reports from both regular and cooperative observers. The inset on this chart shows the departure of the monthly totals from the corresponding normals, as indicated by the reports from the regular stations.

Chart VI.—*Isobars at sea level and isotherms at surface, prevailing winds.*—The pressures have been reduced to sea level and standard gravity by the method described by Prof. Frank H. Bigelow in the REVIEW for January 1902, **30**:13–16. The pressures have also been reduced to the mean of the 24 hours by the application of a suitable correction to the mean of 7:30 a. m. and 7:30 p. m. readings at stations taking two observations daily, and to the 7:30 a. m. or the 7:30 p. m. observation at stations taking but a single observation.

The diurnal corrections so applied, except for stations established since 1901, will be found in the Annual Report of the Chief of the Weather Bureau, 1900–1901, volume 2, table 27, pages 140–164.

The sea-level temperatures are now omitted and average surface temperatures substituted. The isotherms cannot be drawn in such detail as might be desired, for data from only the regular Weather Bureau stations are used.

The prevailing wind directions are determined from hourly observations at almost all the stations. A few stations determine their prevailing directions from the daily or twice-daily observations only.

Chart VII.—*Total snowfall.*—This is based on the reports from regular and cooperative observers and shows the depth in inches of the snowfall during the month. In general, the depth is shown by lines connecting places of equal snowfall, but in special cases figures also are given. This chart is published only when the snowfall is sufficiently extensive to justify its preparation. The inset on this chart, when included, shows the depth of snow on the ground at 7:30 p. m. of the Monday nearest the end of the month and is a copy of the snow chart appearing in the snow and ice bulletin for that week. Generally, the publication of the Weekly Snow and Ice Bulletin commences about the middle of December and continues to near the close of March.

Charts VIII–XII.—Aerological charts, for description and explanations, see p. 22, of this REVIEW.

Charts, XIII–XIV, etc.—*North Atlantic weather maps for particular days.*